Docket No.: 42085-00028USPX
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Mats Tuneld et al.

Application No.: 09/864720

Confirmation No.: 2798

Filed: May 26, 2000

Art Unit: 2178

For: METHOD AND APPARATUS FOR DISPLAYING INFORMATION

Examiner: C. B. Paula

SUBMISSION OF PRIORITY DOCUMENT

MS Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant hereby submits a certified copy of document PCT/CN01/00732 in support of the claim for priority.

Dated: October 4, 2004

Respectfully submitted,

By Michael W. Maddox

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EP2011500011P

证 明

CERTIFICATE

本证明之附件是向中国专利局作为受理局提交的下列国际申请副本

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请 号: **PCT/CN01/00732**

AL APPLICATION NUMBER

请 日: **10 MAY 2001(10.05.01)**

AL FILING DATE

名 称: **Method and Apparatus for Displaying Tnformation**

ENTION

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REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For Receiving Office use only
International Application No. PCT/CN01/00732
International Filing Date 10. MAY 2001 (10.05.01)

RO/CN 中华人民共和国国家知识产权局 PCT International Application
Name of Receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired)(12 characters maximum)* FPEL01150011

Box No.I TITLE OF INVENTION

Method and Apparatus for Displaying Information

Box No.II APPLICANT

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State(i.e. country) of residence if no State of residence is indicated below.)*

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Box No. IV AGENT OR COMMON REPRESENTATIVE: OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicants(s) before the competent International Authorities as: ☒ agent ☐ common representative

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Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

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This person is:
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State (*i.e. country*) of nationality:

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This person is applicant for the purpose of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

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Box No. VI **PRIORITY CLAIM** ☐ Further priority claims are indicated in the Supplemental Box

Filing date of earlier application *(day/month/year)*	Number of earlier application	Where earlier application is:		
		National application: country	Regional application:* regional Office	International application: receiving Office:
item (1) 26.May. 2000 (26.05.00)	PCT/CN00/00132			CN
item (2)				
item(3)				

☒ The receiving Office is hereby to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office)* identified above as item(s):

**Where the earlier applications is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.*

Box No. VII **INTERNATIONAL SEARCHING AUTHORITY**

Choice of International Searching Authority(ISA) *(If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two letter code may be used):*

ISA/ CN

Request to use results of earlier search; reference to that search *(if an earlier search has been carried out by or requested from the International Search Authority):*

Date *(day/month/year)* Numbe Country *(or regional Office)*

Box No. VIII **CHECK LIST: LANGUAGE OF FILING**

This international application contains the following **number of sheets:**

request	:	5
description (excluding sequence listing part)	:	7
claims	:	4
abstract	:	1
drawings	:	5
sequence listing part of description	:	
Total number of sheets	:	22

This international application is accompanied by the item(s) marked below:

1. ☒ fee calculation sheet
2. ☐ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☐ priority document(s) *identified in Box No. VI as item(s):*
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☐ other *(specify)*:

Figure of the drawings which should accompany the abstract: FIG 1

Language of filing of the international application: EN

Box No. IX **SIGNATURE OF APPLICANT OR AGENT**

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not from reading the request)

CHINA PATENT (HONG KONG) LIMITED 專利代理(香港)有限公司 專利申請專用章

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1. Date of actual receipt of the purported international application: 10 MAY 2001 (10.05.01)

2. Drawings:
   ☐ received:
   ☐ not received:

3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:

4. Date of timely receipt of the required corrections under PCT Article 11(2):

5. International Searching Authority specified by the applicant: ISA/

6. ☐ Transmittal of search copy delayed until search fee is paid

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PCT

FEE CALCULATION SHEET

Annex to the Request

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International application No. PCT/CN01/00732

Date stamp of the receiving Office 10 MAY 2001 (10.05.01)

Applicant's or agent's file reference FPEL01150011

Applicant Ericsson Communication SW Research & Development

CACULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE . . . . . CNY 500 **T** — CNY 500.-
2. SEARCH FEE . . . . . CNY 1500 **S** — CNY 1500.-

   International search to be carried out by CN

   (If two or more International Searching Authorities are competent in relation to the international application, indicate the name of the Authority which is chosen to carry out the international search.)
3. INTERNATIONAL FEE

   Basic Fee

   The international application contains 22 sheets.

   first 30 sheets . . . . . CHF 650 **b_1** — CHF 650.-

   _____ (Remaining sheets) x _____ (additional amount) = **b_2**

   Add amounts entered at b_1 and b_2 and enter total at **B** . . . **B**

   Designation Fees

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   6 (number of designation fees payable(*maximum 6*)) x CHF140 (amount of designation fee) = CHF840 **D** — CHF 840.-

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4. FEE FOR PRIORITY DOCUMENT . . . . . CNY150 **P** — CNY 150.-
5. TOTAL FEES PAYABLE

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MODE OF PAYMENT

☒ authorization to charge deposit account (see below)	☐ Bank draft	☐ coupons
☐ cheque	☐ Cash	☐ other(specify):
☐ postal money order	☐ Revenue stamps	

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	09/05/2001	

METHOD AND APPARATUS FOR DISPLAYING INFORMATION

BACKGROUND OF THE INVENTION

1.Technical Field:

The present invention relates generally to a method and an apparatus for displaying information, and in particular to a method and an apparatus for displaying text information in different sort orders.

2. Description of Related Art:

Along with the development of digital technique and Internet, more and more information is processed and displayed digitally. For Example, in many personal computers (PC), personal digital assistants (PDA) and mobile phones, there is a built-in digital address book recording a lot of personal contact information, such as name, address, telephone number etc. When a user wants to find a record in the address book, usually all the records are sorted and displayed in an order. If the records are English, they are displayed in alphabetically, and the user can scroll the list to find the record he or she wants. In the case of Chinese, one of the solutions of the art is that the records are listed in Pinyin order of the records, such as the address book in Netscape Communicator. A similar solution is sorting and displaying in the Zhuyin order, such as the address book of Lotus Organizer(Traditional Chinese Version). In the address book of Microsoft Outlook (Simplified Chinese Version), the letters of Pinyin are mapped into buttons. When a button is pressed, the records beginning with the letter of this button are sorted and displayed. Another solution of the art is sorting the records according to the strokes, for example, the address book of GSL PDA3000.

The defect of the above solutions is that it is not flexible to sort the Chinese information in just one order. English information may be clearly sorted in alphabetical order. However, if Chinese information is sorted in just one order, the user must be familiar with this order. For example, while sorting in Pinyin order, the user must know the correct Pinyin of every

Chinese character. But it is difficult for some Chinese to learn the correct Pinyin because of their accent. Some regions of China, such as Taiwan, use Zhuyin, which is different from Pinyin. Therefore, these people can not use Pinyin order to find out the desired record easily.

Therefore, it would be advantageous to have a flexible method for displaying Chinese text so that the user may use the sort order that he/she is familiar with to find out the desired record easily and quickly.

The object of the present invention is to provide a method for displaying a plurality of Chinese strings in different sort order. The sorted strings are further divided into groups so that the user may search the desired string more quickly.

SUMMARY OF THE INVENTION

The present invention provides a method for displaying information comprising of the steps of selecting one of a plurality of sort order criteria; sorting a plurality of string objects based on the selected sort order of the string objects; and displaying the string objects in the selected sort order.

The present invention also provides an apparatus for displaying information comprising a storage means for storing a plurality of string objects; an input means for selecting user commands; a sorting means for responding to the sort order criteria selected by a user, retrieving a plurality of the string objects from said storage device, and sorting the string objects based on the selected sort order of the string objects; and a display means for displaying the string objects in the selected order.

BRIEF DESCRIPTION OF THE DRAWING

The invention itself as well as further objectives and advantages thereof will be understood by reference to the following detailed description of the embodiments when read in conjunction with the accompanying drawings, wherein:

Figure 1 is a flowchart of a process for displaying string objects depicted in accordance with one embodiment of the present invention.

Figure 2A and 2B are flowcharts of a process for displaying string objects depicted in accordance with another embodiment of the present invention.

Figure 3 is a block diagram illustrating an apparatus in which the present invention may be implemented in accordance with the present invention.

Figures 4A-4C are the user interfaces of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Embodiment 1

With reference to Figure 1, a flowchart of a process for displaying string objects is depicted in accordance with one embodiment of the present invention. The process begins at step 100 where a list of sort order criteria is provided and waits to be selected by the user. These sort order criteria for Chinese may be Pinyin, Zhuyin, stroke, radical, stroke count or other rules of splitting Chinese character. The sort order criteria for Japanese may be kana order, stroke order, or radical order. For Korean, they may be Korean character order, or stroke order. Every sort order criteria may be provided with an identifier, such as a tab, a button or an icon. The user may click on the corresponding identifier to select the desired sort order.

The sort order criteria selected by the user is received at step 102. If the user does not select or it is the first time entering this step, a default sort order criteria may be designated. The default sort order may be pre-selected by the user or the system (e.g. Pinyin order) or it may be that which was in place the last time that method was used (i.e. when the system exited last time, the sort order was stroke order, then the default is set to stroke order) or it may be decided by an algorithm (e.g. set the default sort order to the most frequently used one according to the statistic of the usage of sort orders).

At step 104, the string objects are sorted according to the selected sort order criteria. If the sort order is Pinyin or Zhuyin, the string objects are sorted according to the order of character in the criteria dictionary. If the sort order is stroke, radical or other splitting rules, the string objects are sorted in

predetermined order of the stroke or section of the string objects.

Next in step 106, a group list is provided for the current sort order criteria. Each group may have an identifier, such as a tab, a button or an icon, as shown in Figures 4A-AC. For Pinyin order, the groups may be "ABC", "DEF", "GHI", "JKL", "MN", " OPQ ", "RST", "UVW, "XYZ" and other. For Zhuyin, the groups may be "ㄅ-ㄈ", "ㄉ-ㄌ", "ㄍㄎㄏ", "ㄐㄑㄒ", "ㄓ-ㄖ", "ㄗ-ㄙ", "ㄚ-ㄝ", "ㄞ-ㄡ", "ㄢ-ㄦ" and others. For stroke order, the groups may be "一", " 丨", "丿", "丶", "乚ㄱ 乀"and others. For stroke count order, the groups may be "1-5 strokes", "6-10 strokes", "11-15 strokes", "16-20 strokes", "above 20 strokes" and other. The number of groups in a sort order are decided by the number of identifiers that can be displayed on the screen or the number of objects that included in the groups. For example, when the screen have enough area to display 10 tabs simultaneously, then the string objects may be divided into 10 groups. They also may be divided so that every group actually has or statistically will have substantially the same number of string objects.

The group selected by the user is received at step 108. If the user does not select or it is the first time entering this step, a default group may be designated. Every sort order has a default group. The default group may be pre-selected by the user or the system or it may be that which was in place the last time that method was used or it may be decided by an algorithm. For example, for Pinyin order, the default group is "ABC". For stroke order, the default group is "一". For stroke count order, the default group is "1-5 strokes". For Zhuyin order, the default group is "ㄅ-ㄈ".

Next, at step 110, the string objects belonging to the selected group are displayed in a manner different from that of other groups, such as the string objects of the selected group are displayed while other objects are hidden, the string objects of the selected group are enlarged, highlighted, blinked, or the font and/or color of the selected group are changed. It is also possible to scroll the list of string objects and move a cursor to location of the first object of the selected group.

Thereafter in step 112, a determination is made as to whether other

group need to be selected. If so, the process loops back to step 106. Otherwise, the process goes to step 112 where a determination is made as to whether the process should be stopped. If so, the process stops. Otherwise, the process then returns to step 100.

Embodiment 2

With reference now to Figure 2A and 2B, flowcharts of a process for displaying string objects is depicted in accordance with another embodiment of the present invention.

The process begins at step 200 by designating a default sort order criteria and a default group. Next at step 202, the string objects are sorted as in step 104 of Figure 1. At step 204, the string objects of the default group are displayed as in step 110 of Figure 1. At step 206, a list of sort order criteria is provided and waits to be selected by user. After receiving a selection of the user at step 208, a determination is made as to whether the selected sort order criteria is different from the current order at step 210. If the order is not changed, the process skips to step 218. If the sort order is changed, then the process proceeds to the next step 212 where the groups corresponding to the new sort order are activate. Next at step 214, a default group is designated. Thereafter at step 216, the screen is updated using the new sort order and the default group. Next at step 218, a list of groups is provided and waits to be selected. The group selected by the user is received at step 220 and a determination is made at step 222 as to whether the selected group is different from the current group. If the group is not changed, the process skips to step 230. If the group has changed, the process proceeds to step 224 where a determination is made as to whether the selected group belongs to the current sort order criteria. If so, the process proceeds to step 228. If not, the string objects are re-sorted according to the sort order criteria of the selected group at step 226. Thereafter at step 228, the screen is updated using the new group. Next at step 230, a determination is made as to whether the process should be stopped. If so, the process stops. Otherwise, the process then returns to step 206 and waits for the next selection.

With reference now to Figure 3, the block diagram illustrates an information displaying apparatus in which the present invention may be implemented. Information displaying apparatus 300 is an example of a personal computer. Information displaying apparatus 300 employs a peripheral component interconnect (PCI) local bus architecture. Processor 302 and main memory 306 are connected to PCI local bus 308 via PCI bridge 304. The SCSI host bus adapter 310 and the expansion bus interface 312 are connected to PCI local bus 308 by direct component connection. The graphics adapter 314 is connected to PCI local bus 308 by add-in boards inserted into expansion slots. The SCSI host bus adapter 310 provides a connection for hard disk 316 and CD-ROM 318. The expansion bus interface 312 provides a connection for a keyboard and mouse adapter 320 and modem 322. An operating system runs on processor 302 and is used to provide control for various components within information displaying apparatus 300 in Figure 3. The operating system may be a commercially available operating system such as Windows 95, which is available from Microsoft Corporation. "Windows 95" is a trademark of Microsoft Corporation.

Those of ordinary skill in the art will appreciate that the hardware in Figure 3 may vary depending on the implementation. Although the depicted example employs a PCI bus, other bus architectures such as Micro Channel and ISA may also be used. Other internal hardware or peripheral devices, such as LAN card, audio card, may be used in addition to the hardware depicted. Other operating systems, such as OS/2, UNIX and LINUX, may also be employed to control the apparatus 300. Although information displaying apparatus 300 depicted in Figure 3 is a personal computer, other devices that are capable of displaying text information could also be used to implement the method of the present invent, such as personal digital assistant (PDA), smart phone or mobile phone.

The Figures 4A-4C are interfaces of the present invention, wherein the string objects are names in an address book. Figure 4A illustrates that group identifiers of different sort order criteria may be displayed simultaneously. In this example, the group identifiers of stroke order (i.e. "—", " | ",

"丿", "丶", "乚 ㄱ 乀") are displayed together with the group identifiers of Pinyin order (i.e. "A-G", "H-N", "O-T", "U-Z"). Those of ordinary skill in the art will appreciate that the string objects may be any list of text information, such as links of Internet addresses and file names.

The description of the present invention has been presented for the purpose of illustration, but is not intended to limit the invention in the form disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art. For example, the groups of Pinyin may be "A-G", "H-N", "O-T", "U-Z", "0-9"and others, or "A-D", "E-H", "I-O", "P-U", "V-Z" and others. For stroke count order, the groups may be "1-5 strokes", "6-9", "10-14", "15-20", "above 20" and other. The rule of splitting Chinese characters may also be different, for example, Chinese characters may be split to 5 basic strokes or 10 basic strokes according to the direction and size of the strokes. The present invention may also be applied to other languages.

CLAIMS

1. A method for displaying a plurality of string objects, consisting of the following steps:

selecting one of a plurality of sort order criteria;

sorting a plurality of said string objects based on the selected sort order of said string object; and

displaying a plurality of said string objects in selected sort order.

2. The method as defined in claim 1, wherein an identifier is provided for each of said sort order criteria; a user may select one of the identifiers; if none of the identifiers is selected, then a default sort order is designated and a plurality of said string objects are sorted and displayed according to the default sort order criteria.

3. The method as defined in claim 2, wherein the default sort order may be pre-selected by the user or the system or it may be that which was in place the last time that method was used or it may be decided by an algorithm.

4. The method as defined in claim 1, further comprising the following steps after the step of selecting the sort order criteria :

further dividing a plurality of said string objects into a plurality of groups;

selecting one of said groups;

displaying the string objects of the selected group in a manner that is different from the manner of displaying the string objects of other groups.

5. The method as defined in claim 1, further comprising the following steps after the step of selecting the sort order criteria :

further dividing a plurality of said string objects into a plurality of groups;

selecting one of said groups;

moving a cursor to the location of the string objects of the selected group.

6. The method as defined in claim 4, said different manner of displaying

string objects comprise (but not limit to) one or more of blinking, changing the font, enlarging the size, highlighting or changing color of the string objects.

7. The method as defined in claim 4 or 5, wherein an identifier is provided for each group; a user may select one of the identifiers; if none of the identifiers is selected, then a default group is designated, string objects of the default group are displayed in a manner that is different from the manner of displaying the string objects of other groups or the cursor is moved to the location of the string objects of the selected group.

8. The method as defined in claim 7, wherein said identifiers of groups that belong to different sort order criteria may be displayed simultaneously, the string objects are re-sorted if the selected group does not belongs to the current sort order criteria.

9. The method as defined in claim 7, wherein the default group may be pre-selected by the user or the system or it may be that which was in place the last time that method was used or it may be decided by an algorithm.

10. The method as defined in claim 4, 5, or 6, wherein the number of groups is decided by the number of identifiers that can be displayed or the number of objects included in the groups.

11. The method as defined in any one of claim 1 to 5, wherein said sort order criteria comprise alphabet order, Pinyin order, Zhuyin order, stroke order, stroke count order, radical order, kana order or Korean character order.

12. The method as defined in any preceding claim, wherein said string objects may be one of personal data in an address book, links of Internet addresses, file names or other list of text.

13. An apparatus for displaying a plurality of string objects, comprising:

a storage means for storing a plurality of said string objects;

an input means for entering user commands;

a sorting means for responding to the sort order criteria entered by a user, retrieving a plurality of said string objects from said storage device, and sorting a plurality of said string objects based on the selected sort order of

the string objects; and

a display means for displaying a plurality of said string objects in the selected sort order.

14. The apparatus as defined in claim 13, wherein an identifier is provided for each of said sort order criteria on said display means, a user may select one of the identifiers by said input means; if none of the identifiers is selected, then a default sort order is designated and a plurality of said string objects are sorted and displayed according to the default sort order criteria.

15. The apparatus as defined in claim 14, wherein the default sort order may be pre-selected by the user or the system or it may be that which was in place the last time that method was used or it may be decided by an algorithm.

16. The apparatus as defined in claim 13, further comprising:

a grouping means for further dividing said sorted string objects into a plurality of groups; selecting one of said groups; and displaying the string objects of the selected group in a manner that is different from the manner of displaying the string objects of other groups.

17. The apparatus as defined in claim 13, further comprising:

a grouping means for further dividing said sorted string objects into a plurality of groups; selecting one of said groups; and moving a cursor to the location of string objects of selected group.

18. The apparatus as defined in claim 16, said different manner of displaying string objects comprise (but not limit to) one or more of blinking, changing the font, enlarging the size, highlighting or changing color of the string objects.

19. The apparatus as defined in claim 16 or 17, wherein an identifier is provided for each group on said display means, a user may select one of the identifiers; if none of the identifiers is selected, then a default group is designated, and only the string objects of the default group are displayed or the first string object of the default group is highlighted.

20. The apparatus as defined in claim 13, wherein said identifiers of groups that belong to different sort order criteria may be displayed simultaneously, the string objects are re-sorted if the selected group does not belongs to the current sort order criteria.

21. The apparatus as defined in claim 19, wherein the default group may be pre-selected by the user or the system or it may be that which was in place the last time that method was used or it may be decided by an algorithm.

22. The method as defined in claim 16, 17 or 18, wherein the number of groups is decided by the number of identifiers that can be displayed or the number of objects included in the groups.

23. The method as defined in any one of claim 13 to 18, wherein said sort order criteria comprise alphabet order, Pinyin order, Zhuyin order, stroke order, stroke count order, radical order, kana order or Korean character order.

24. The apparatus as defined in any one of claim 13 to 23, wherein said string objects may be one of personal data in an address book, links of Internet addresses, file names or other list of text.

25. The apparatus as defined in any one of claim 13 to 24, wherein said apparatus is either a computer, a personal digital assistant (PDA), a mobile phone, a smart phone or other electrical device that is capable of displaying text information.

ABSTRACT

The present invention relates to a method and an apparatus for displaying text information in different sort orders. The method comprises the steps of selecting one of a plurality of sort order criteria; sorting a plurality of string objects based on the selected sort order; and displaying the string objects in selected sort order. The string objects may further be divided into groups, and the string objects of the selected group are displayed in a manner that is different from the manner of displaying the string objects of other groups or the cursor is move to the location of string objects of the selected group. The user may use different sort orders and groups to find out the desired record.

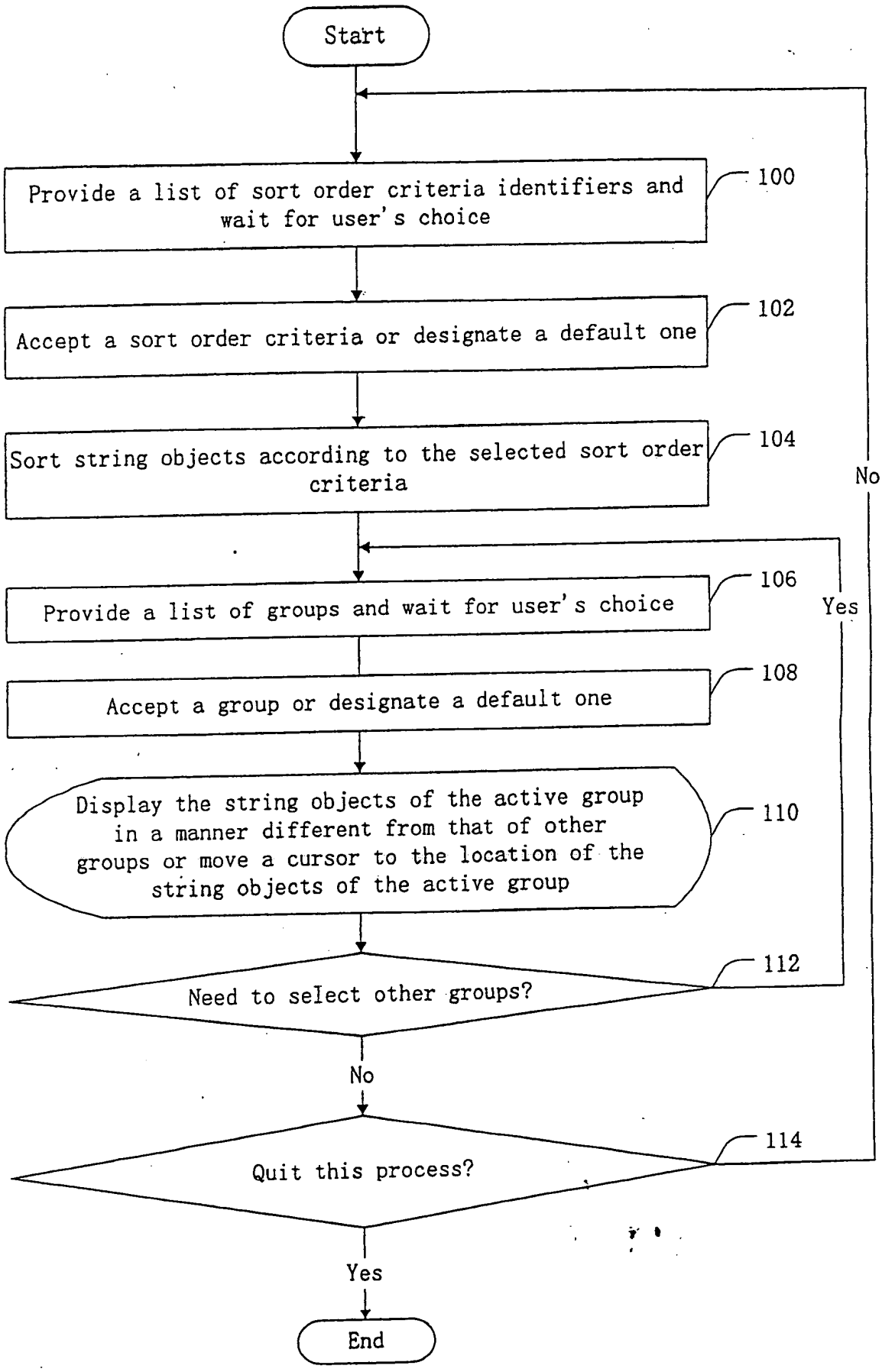
Start
Provide a list of sort order criteria identifiers and wait for user's choice
100
Accept a sort order criteria or designate a default one
102
Sort string objects according to the selected sort order criteria
104
Provide a list of groups and wait for user's choice
106
Accept a group or designate a default one
108
Display the string objects of the active group in a manner different from that of other groups or move a cursor to the location of the string objects of the active group
110
Need to select other groups?
112
Yes
No
Quit this process?
114
No
Yes
End

Fig. 1

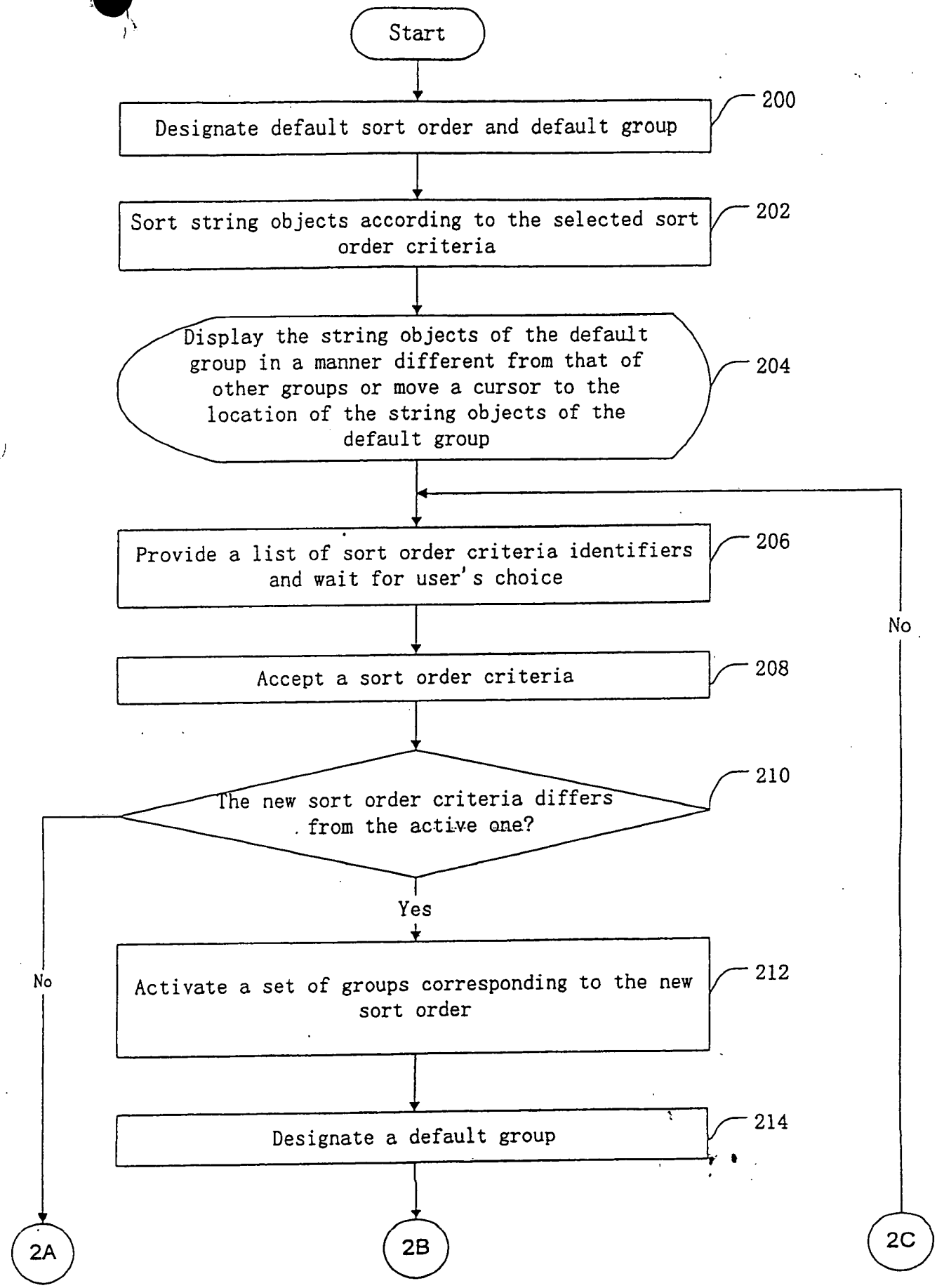
Start
Designate default sort order and default group
200
Sort string objects according to the selected sort order criteria
202
Display the string objects of the default group in a manner different from that of other groups or move a cursor to the location of the string objects of the default group
204
Provide a list of sort order criteria identifiers and wait for user's choice
206
Accept a sort order criteria
208
The new sort order criteria differs from the active one?
210
Yes
No
No
Activate a set of groups corresponding to the new sort order
212
Designate a default group
214
2A
2B
2C

Fig. 2A

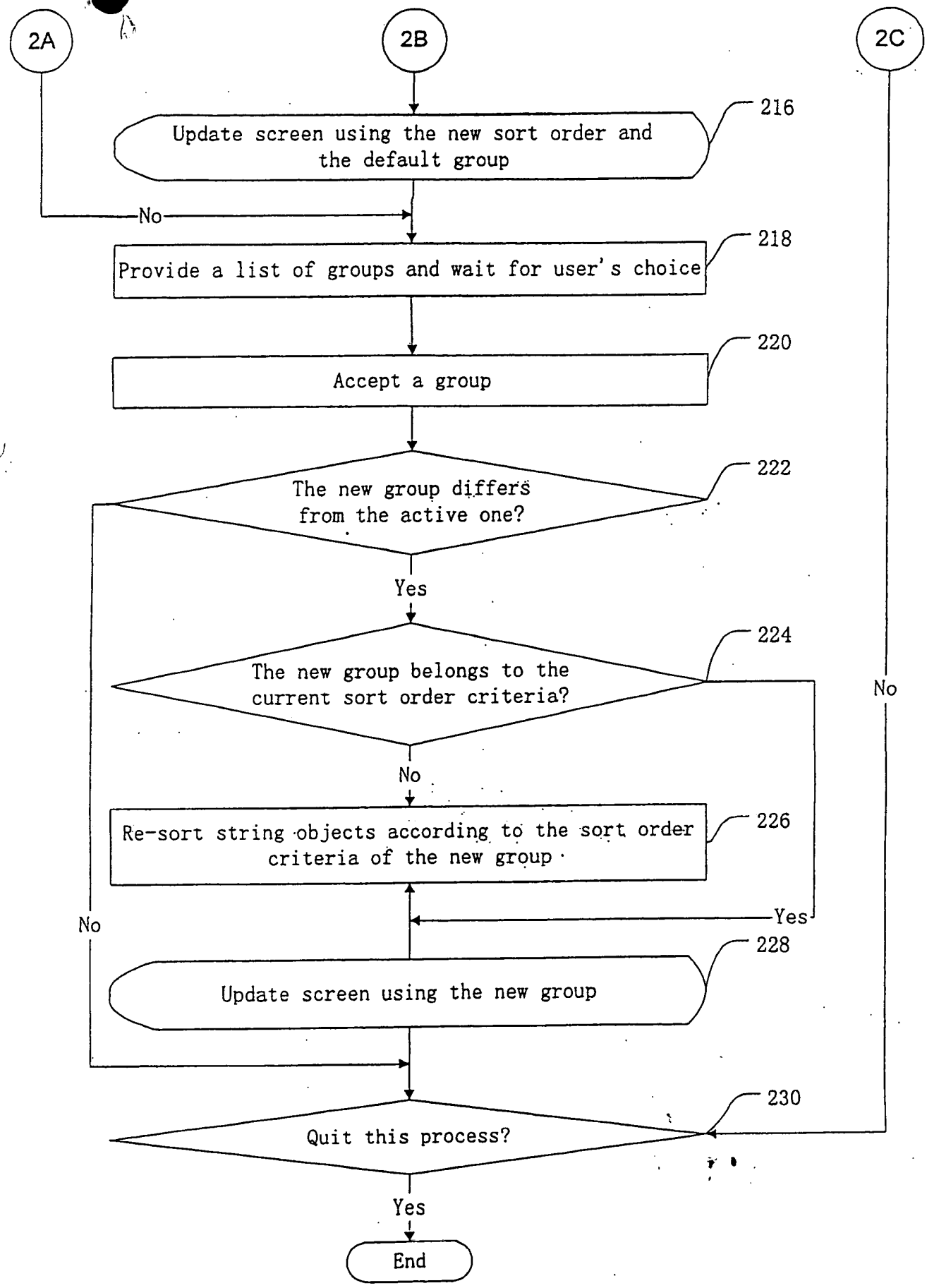
2A
2B
2C
Update screen using the new sort order and the default group
216
No
Provide a list of groups and wait for user's choice
218
Accept a group
220
The new group differs from the active one?
222
Yes
The new group belongs to the current sort order criteria?
224
No
Re-sort string objects according to the sort order criteria of the new group
226
Yes
No
No
Update screen using the new group
228
Quit this process?
230
Yes
End

Fig. 2B

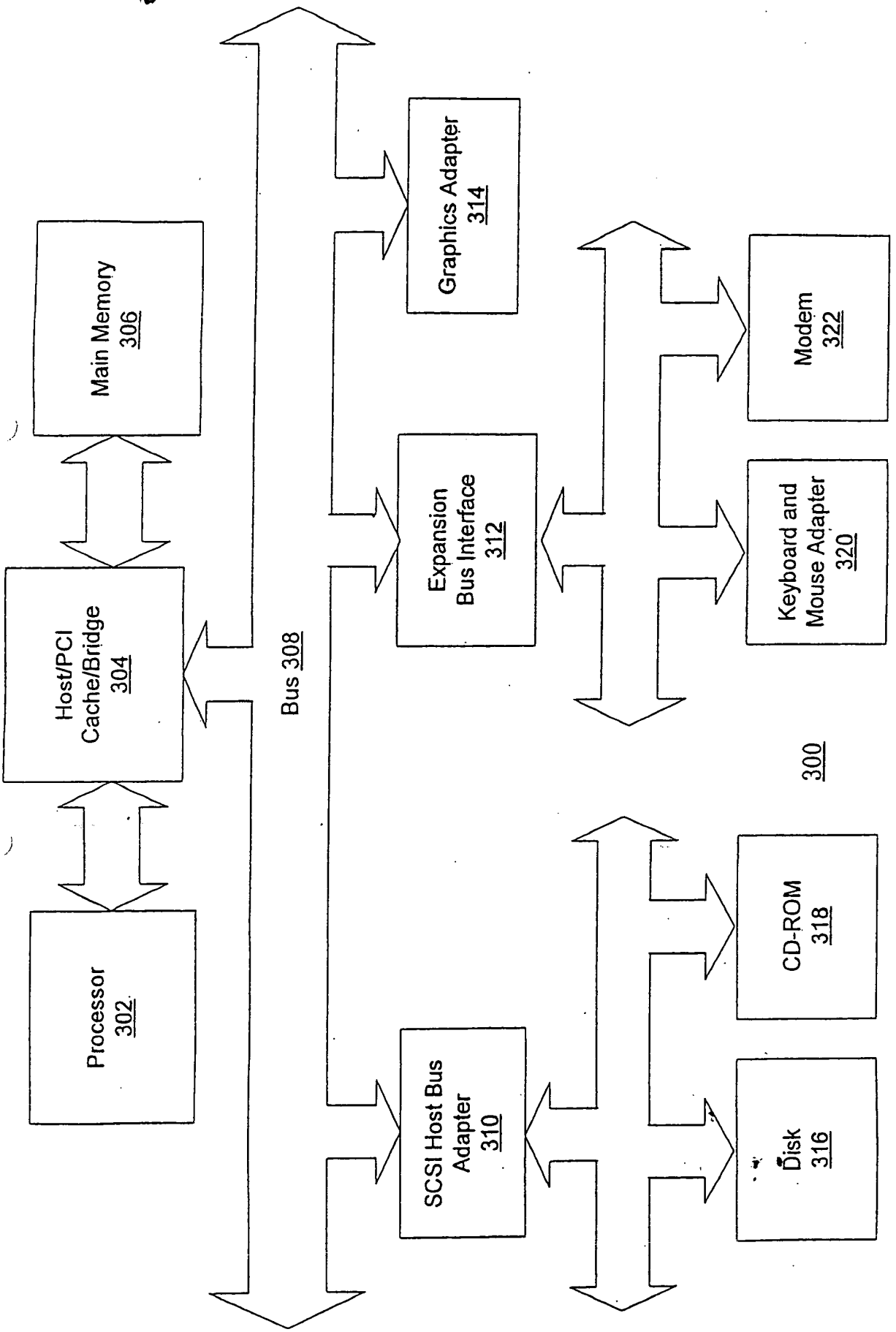
Main Memory
306
Graphics Adapter
314
Modem
322
Host/PCI
Cache/Bridge
304
Expansion
Bus Interface
312
Keyboard and
Mouse Adapter
320
Bus 308
300
Processor
302
SCSI Host Bus
Adapter
310
CD-ROM
318
Disk
316

Fig. 3

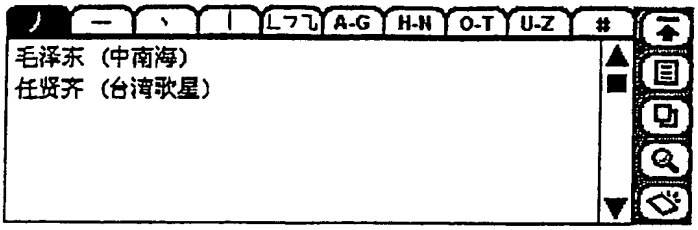

Fig. 4A

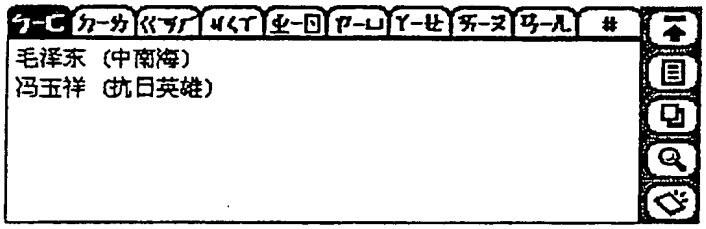

Fig. 4B

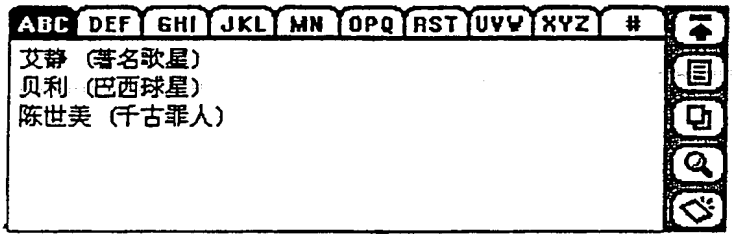

Fig. 4C